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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

TRAN, VINCENT HUY

ART UNIT

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2115

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/575,041	Applicant(s) ADACHI ET AL.	
	Examiner VINCENT T. TRAN	Art Unit 2115	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 December 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-16,18-26 and 28-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-10, 11-16, 18-26, 28-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. This Office Action is responsive to the communication filed on 12/17/2009.
2. Claims 1, 3-10, 11-16, 18-26, 28-35 are pending for examination.

Claim Objections

3. Claims 1, 5, 9, 13, 16, 20, 21, 25, 26, 30, objected to because of the following informalities: the claims recite “by combinations each” are unclear. Appropriate correction is required. Suggest correction “defined by combinations wherein each combination comprising.”
4. Claim 22 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. claim recites “switches between the operation points in accordance with the temperature” which already claimed in claim 21.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 26, 28-30, 35 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.
6. Claims 26 and 30 recite “a processor readable storage medium” where the presented specification by applicants does not disclose anywhere about “a processor readable storage media.” In this instance, applicants have failed to provide antecedent basis for the claim

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terminology "a processor readable storage media." Therefore, the question becomes whether non-statutory embodiments would be fairly conveyed to one of ordinary skill the terminology utilized. In this instance, it would appear to be reasonable to interpret media for "carrying" as fairly conveying signals and other forms of propagation or transmission media to one of ordinary skill. Since signals cannot properly be categorized as machine, process, article of manufacture, or composition of matter, the claims are directed towards non-statutory subject matter.

7. Claims 28-29, 35 are rejected as being dependent upon a rejected base claim under 35 U.S.C. 101 set forth in this Office action.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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8. Claims 1, 5-8, 9, 13-16, 20-22, 25-26, 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rusu et al. US Patent No. 7,111,178 (“Rusu”).

9. As per claim 1, Rusu teaches a method of controlling a processor [PROCESSOR 102] comprising consulting a table [*Fuse array 214 is a memory located on the processor and contains information as the operating points based on a different frequency and voltage points – col. 6 lines 32-36*] that lists a plurality of operations points defined by combinations [*the combination of different frequency and voltage points*] each comprising one of a plurality of operating frequencies available for used by switching, so as to switch [step 316 fig. 3] between the operation points in accordance with a temperature [col. 6 lines 39-50].

The controller 108 of this embodiment **reads an array 214 of fuses** that binary encode the min, max, and default or wakeup values for the following parameters: the operating voltage, the operating frequency, and voltage/frequency adjustment steps. The voltage/frequency adjustment steps are pairs of working voltage/frequency points that the controller is designed to step through. During normal operation, controller 108 reads in a sensor value and determines how much power the processor 102 is consuming. The controller 108 compares this power consumption value with the stored operating points loaded from the fuse array 214 to **determine what processor frequency and voltage points will allow for optimal performance while remaining within the allowable or tolerable power and thermal envelope.**

Rusu does not explicitly teach each combination comprising the number of processing blocks formed inside a processor and in operation. However, it is obvious to one of ordinary skill in the art that the each combination of Rusu inherently encompasses at least one processing blocks formed inside a processor and in operation since the processor of Rusu would be inoperable if there are no processing blocks formed inside a processor to perform a task.

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10. As per claim 5, it is substantially directed to the system set forth in claim 1 and therefore are rejected under the same basic.

11. As per claim 6, Rusu teaches the table lists the plurality of operating points [*frequency operating points*] in the order of processing performance [*each frequency represents optimal performance based on maximum thermal envelope, and tolerable power – see claim 1*].

12. As per claim 7, Rusu teaches when the processor is predicted to exceed or exceeds a predetermined threshold in temperature [step 310 and 312 – sense temperature], an operation point yielding a smaller amount of heat generation than that of an operation point selected currently is detected out of the operation points, so that the operation point selected currently is switched to the operation point detected [step 314 and 316 of fig. 3].

13. As per claim 8, Rusu teaches plurality of combinations operation points are detected, the operation point selected currently is switched to a operation point yielding maximum performance [col. 6 lines 39-50].

14. As per claim 9, Rusu teaches a processor [102] comprising:

a plurality of processing blocks [*inherent-for example: core and other functional units*];

a sensor which measures a temperature [*col. 7 line 67 to col. 8 line 1 –sensor may sense temperature*];

a table [Fuse Array 214] that lists a plurality of operations points defined by combinations [*the combination of different frequency and voltage points*] each comprising one of a plurality of operating frequencies available for used by switching [see discussion in claim 1];
and

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a control unit [108] which consults the table and switches between the operation points in accordance with the measured temperatures [see claim 1].

Rusu does not explicitly teach each combination comprising the number of processing blocks in operation. However, it is obvious to one of ordinary skill in the art that the each combination of Rusu inherently encompasses at least one processing blocks in operation since the processor of Rusu would be inoperable if there are no processing blocks formed inside a processor to perform a task.

15. As per claims 13-15, they are substantially directed to the system set forth in claims 9, 6 and 7 and therefore are rejected under the same basic.

16. As per claim 16, it is substantially directed to the system set forth in claim 9 and therefore are rejected under the same basic.

17. As per claims 20 and 21, they are substantially directed to the system set forth in claim 9 and therefore are rejected under the same basic.

18. As per claim 22, see discussion in claim 9.

19. As per claim 25, it is substantially directed to the system set forth in claim 9 and therefore are rejected under the same basic.

20. As per claims 26 and 30, they are directed to a processor readable storage medium to implement the method of steps as set forth in claim 1. Therefore, it is rejected on the same basis as set forth hereinabove.

21. Claims 3, 11, 18, 23, 28, are rejected under 35 U.S.C. 103(a) as being unpatentable over Rusu as applied to claim 1 or 9 or 16 or 21 or 26 above, and further in view of Guo.

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As per claim 3, Rusu teaches a method of determining what processor frequency and voltage points which would allow for optimal performance while remaining within the allowable thermal envelope. Rusu does not teach the method of allocating tasks in consideration of the number of the processing blocks available in parallel, the number being determined task by task.

Guo teaches another system and method for scheduling jobs in a multiprocessor machine. Specifically, Guo teaches allocating tasks in consideration of the number of the plurality of processing blocks available in parallel, the number being determined task by task [*paragraph 0021, 0060-0061, 0081, 0093 – based on task by task, each task define the resource requirement (number of processor), the scheduler provides a list of best available resource (number of available processor)*].

At the time of the invention was made, it would have been obvious to one of ordinary skill in the art to have modified the system of Rusu with the number of available processing block being determined task by task of Guo. The motivation for doing so would have been, as taught by Guo, to avoid a task being poorly allocated and adversely affecting the operating efficiency of the system.

22. As per claims 11, 18, 23, 28 see discussion in claim 3.

23. Claims 4, 12, 24, 29, 31-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rusu as applied to claim 1 or 9 or 16 or 21 or 26 above, and further in view of Luick.

24. As per claim 4, Rusu does not teach allocating tasks to at least a processing block having a lowest temperature among the plurality of processing block. Luick teaches another method of task switching in a symmetric multiprocessing system that will determine when a heat buildup in

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a unit of a processor is occurring. Specifically, Luick teaches allocating tasks to at least a processing block having a lowest temperature among the plurality of processing block [paragraph 0062]. As the time of the invention was made, it would have been obvious to one of ordinary skill in the art to have modified the system of Rusu with the allocating tasks to at least a processing block having a lowest temperature among the plurality of processing block of Luick in order to prevent the processor from becoming too hot.

25. As per claim 12, 19, 24, 28, 31-35 see discussion in claim 4.

Response to Arguments

Applicant's arguments with respect to claims 1, 3-10, 11-16, 18-26, 28-35 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VINCENT T. TRAN whose telephone number is (571)272-7210. The examiner can normally be reached on 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas c. Lee can be reached on (571)272-3667. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Vincent T Tran/
Primary Examiner, Art Unit 2115